

WHAT IS CLAIMED IS:

1. A CMP slurry comprising:  
a solvent;  
abrasive grains; and  
5 a silicone-based surfactant having an HLB value ranging from 7 to 20.
2. The CMP slurry according to claim 1, wherein said silicone-based surfactant has an HLB value ranging from 10 to 17.
- 10 3. The CMP slurry according to claim 1, wherein said silicone-based surfactant comprises at least one copolymer selected from the group consisting of polyoxyethylene/methylpolysiloxane copolymer, poly(oxyethylene/oxypropylene)  
15 methylpolysiloxane copolymer, polyoxyethylene alkylpolysiloxane/polyoxypropylene alkylpolysiloxane/dimethylpolysiloxane copolymer, and methylpolysiloxane/alkylmethylpolysiloxane/poly(oxyethylene/oxypropylene) methylpolysiloxane copolymer.
- 20 4. The CMP slurry according to claim 1, wherein the content of said silicone-based surfactant is within the range of 0.001 wt% to 0.5 wt%.
5. The CMP slurry according to claim 1, further comprising resin particles.
- 25 6. The CMP slurry according to claim 5, wherein the content of said resin particles is within the range of 0.05 wt% to 1 wt%.

7. The CMP slurry according to claim 1, further comprising at least one component selected from the group consisting of an oxidizing agent, a chelate complexing agent and a non-silicone-based surfactant.

5           8. A method for manufacturing a semiconductor device comprising:

          forming an insulating film above a semiconductor substrate;

          forming a recessed portion in said insulating  
10       film;

          depositing a conductive material inside said recessed portion and on said insulating film to form a conductive layer; and

          removing the conductive material deposited on said  
15       insulating film by CMP using a CMP slurry to expose said insulating film, said CMP slurry comprising a solvent, abrasive grains and a silicone-based surfactant having an HLB value ranging from 7 to 20.

          9. The method according to claim 8, wherein said  
20       silicone-based surfactant included in said CMP slurry comprises at least one copolymer selected from the group consisting of polyoxyethylene/methylpolysiloxane copolymer, poly(oxyethylene/oxypropylene) methylpolysiloxane copolymer, polyoxyethylene  
25       alkylpolysiloxane/polyoxypropylene  
          alkylpolysiloxane/dimethylpolysiloxane copolymer, and  
          methylpolysiloxane/alkylmethylpolysiloxane/poly(oxyethy

lene/oxypropylene) methylpolysiloxane copolymer.

10. The method according to claim 8, wherein the content of said silicone-based surfactant in said CMP slurry is within the range of 0.001 wt% to 0.5 wt%.

5 11. The method according to claim 8, wherein said CMP slurry further comprises at least one component selected from the group consisting of an oxidizing agent, a chelate complexing agent and a non-silicone-based surfactant.

10 12. The method according to claim 8, wherein said conductive layer is formed by successively depositing a barrier metal and Cu.

15 13. The method according to claim 8, wherein said insulating film is formed by forming a first insulating film having a relative dielectric constant of less than 2.5 and forming a second insulating film on the first insulating film, said second insulating film having a relative dielectric constant higher than that of the first insulating film.

20 14. A method for manufacturing a semiconductor device comprising:

forming an insulating film above a semiconductor substrate;

25 forming a recessed portion in said insulating film;

depositing a conductive material inside said recessed portion and on said insulating film to form

a conductive layer;

removing said conductive material deposited on  
said insulating film to expose said insulating film  
while selectively leaving said conductive layer  
5 deposited inside said recessed portion, thereby forming  
a buried wiring layer; and

treating surfaces of said buried wiring layer and  
of said insulating film by using a treating solution  
comprising a silicone-based surfactant having an HLB  
10 value ranging from 7 to 20 and dissolved in water.

15. The method according to claim 14, wherein said  
conductive layer is formed by successively depositing  
a barrier metal and Cu.

16. The method according to claim 14, wherein said  
15 insulating film is formed by forming a first insulating  
film having a relative dielectric constant of less than  
2.5; and forming a second insulating film on the first  
insulating film, said second insulating film having  
a relative dielectric constant higher than that of the  
20 first insulating film.

17. The method according to claim 14, wherein said  
silicone-based surfactant in said treating solution has  
an HLB value ranging from 10 to 17.

18. The method according to claim 14, wherein  
25 said silicone-based surfactant included in said  
treating solution comprises at least one copolymer  
selected from the group consisting of

polyoxyethylene/methylpolysiloxane copolymer,  
poly(oxyethylene/oxypropylene) methylpolysiloxane  
copolymer, polyoxyethylene  
alkylpolysiloxane/polyoxypropylene

5 alkylpolysiloxane/dimethylpolysiloxane copolymer, and  
methylpolysiloxane/alkylmethylpolysiloxane/poly(oxyethy  
lene/oxypropylene) methylpolysiloxane copolymer.

19. The method according to claim 14, wherein the  
content of said silicone-based surfactant in said  
10 treating solution is within the range of 0.001 wt% to  
1.0 wt%.

20. The method according to claim 14, wherein  
a polishing rate of said insulating film and said  
conductive layer by said treating solution is 10 nm/min  
15 or less.